Floor-Cleaning Technology Breakthrough Sweeps, Washes, Polishes in One Pass

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Floor care is a huge expense for most businesses and organizations. While most of the expense – up to 95 percent – is labor, keeping floors clean, attractive and safe also involves investment in and maintenance of multiple pieces of equipment. In applications such as grocery stores, big-box retail, hospitals, airports and public buildings, vinyl and terrazzo floors typically require daily maintenance. This cleaning process often involves four separate operations – sweeping, scrubbing, burnishing and dusting – with two or three different floor machines in addition to manual dusting. The process is time-consuming, labor-intensive and expensive.

For years, manufacturers have tried to design and build machines that combine all floor-cleaning and maintenance operations. Until now, the most successful of these designs has been the combination sweeper-scrubber that sweeps up dust and light debris, and then scrubs and dries the floor in one pass. While the use of sweeper-scrubbers has improved floor care productivity, the burnishing and dusting operations have remained separate. Various attempts at a total "one-pass" machine have been tried over the years, but none has been truly successful in preserving the finish that is thought to be the essence of the attractively clean floor.

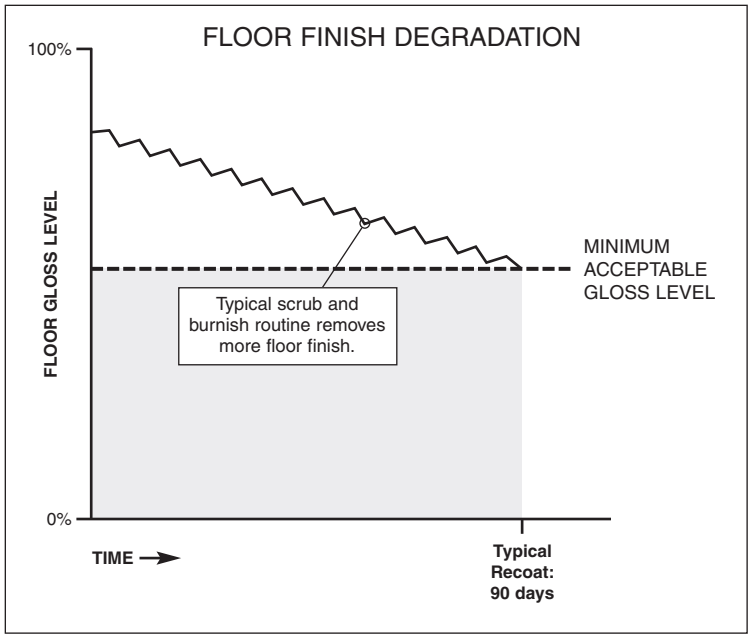

Figure 1

NEEDED — A BREAKTHROUGH

A major problem to overcome in the design of a one-pass floor machine has been creating a cleaning method that combines the very different processes needed in each of the four operations - sweeping, scrubbing, polishing and dusting. Sweeping utilizes a cylindrical brush rotating at a relatively slow speed to accelerate dirt and debris up into a collection pan. Scrubbing is the application of water and detergent and the mechanical abrasion of either disc or cylindrical brushes operating at a relatively slow speed, followed by vacuum collection of the dirty wash water.

Burnishing, on the other hand, requires a synthetic fiber pad mounted on a high-speed rotating disc. The high speed creates just enough friction and heat to partially melt the top layer of floor finish, which helps to restore the shine. In the process, however, fragments of the fiber pad and filaments of finish debris are

created which then need to be manually collected with a hand dust mop. Burnishing never totally restores the floor to its original gloss, and the rather aggressive polishing and finish abrasion lead to frequent stripping and re-finishing – another costly and time consuming operation.

What has been needed is a technological breakthrough that satisfies all these different process needs without significant compromises in any of the separate operations. In other words, the objective has been to create a new machine that sweeps, washes and restores the floor's finish in one pass.

NEW ADVANCE ADHANCER™ ONE-PASS MACHINE

In designing the new Advance Adhancer technology, engineers focused on four critical areas: cylindrical brush speed, cylindrical brush material, controlled brush pressure and detergent chemistry. Former unsuccessful one-pass technologies just tried to increase the brush speed without changing the brush material, pressure or detergents. Research by Advance engineers has shown that all four elements needed to be modified to be successful.

Advance Adhancer One-Pass floor system combines sweeping, scrubbing, polishing and dusting into one operation, using either a walk-behind or ride-on unit.

Cylindrical brush speed – Most polishers operate in an rpm range that is high enough to create enough heat to partially melt the surface of the finish. The new Adhancer technology involves dual counter-rotating cylindrical brushes operating at a high enough speed to preserve the finish, but not high enough to spray water and detergent.

Cylindrical brush material – Most brushes on sweeper-scrubbers are stiff-bristled nylon or polypropylene that are made for aggressive cleaning. However, the design of the bristle is not fine enough to polish a finished surface, nor does it generate enough friction or heat to melt the finish - even at high speed. Advance engineers found that by modifying the tip of the bristles, it created a brush with the softness and fineness of a synthetic fiber pad - yet still retained the stiffness necessary for good sweeping and scrubbing.

Brush pressure – A high downward brush pressure is preferred for aggressive sweeping and scrubbing, but if the cleaning is too aggressive, too much finish is removed along with the dirt, and the finish is dulled more quickly. The Adhancer technology uses a moderate downward brush pressure to ensure proper cleaning yet still allows the brushes to maintain their high revolutions. Sensors in the machine maintain the correct downward pressure even when there is a change in floor level or composition.

Detergents – Another key to the one-pass puzzle was the detergent. Aggressive detergents clean well, but they also partially strip and dull the finish. However, a new class of so-called “snap-back” detergents has emerged that offer good cleaning without significantly dulling the finish. While not always suitable for

heavily soiled floors in an industrial environment, these snap-back detergents are best suited to composition floors that are only subjected to foot traffic and normal dirt. However, by combining them with a polishing function, they perform well to extend the life of a finished surface.

The new Adhancer multi-tasking technology sweeps, washes, leaves the shine and dusts all in one pass, and the technology is available in both walk-behind and rider models. The machine has dual high-speed counter-rotating cylindrical brushes. At the back of the machine, a parabolic squeegee collects the dirty solution and vacuum-dries the floor. No finish or fiber debris is created and no further floor care operations are necessary.

EXTENDING THE TIME BETWEEN RE-FINISHING

When a floor is stripped, re-finished and polished, it is at its maximum gloss. Daily sweeping and scrubbing decreases this gloss due to mechanical abrasion and chemical attack by aggressive detergents. The gloss is somewhat restored by burnishing and dusting – but never to the previous level. As illustrated in Figure 2, with repeated conventional sweep, scrub, burnish and dust operation, the gloss eventually ratchets down to an unacceptable level. At that point, the floor is usually stripped and re-finished again. In applications that involve daily cleaning, the strip and re-finish routine needs to occur approximately every 80 to 90 days.

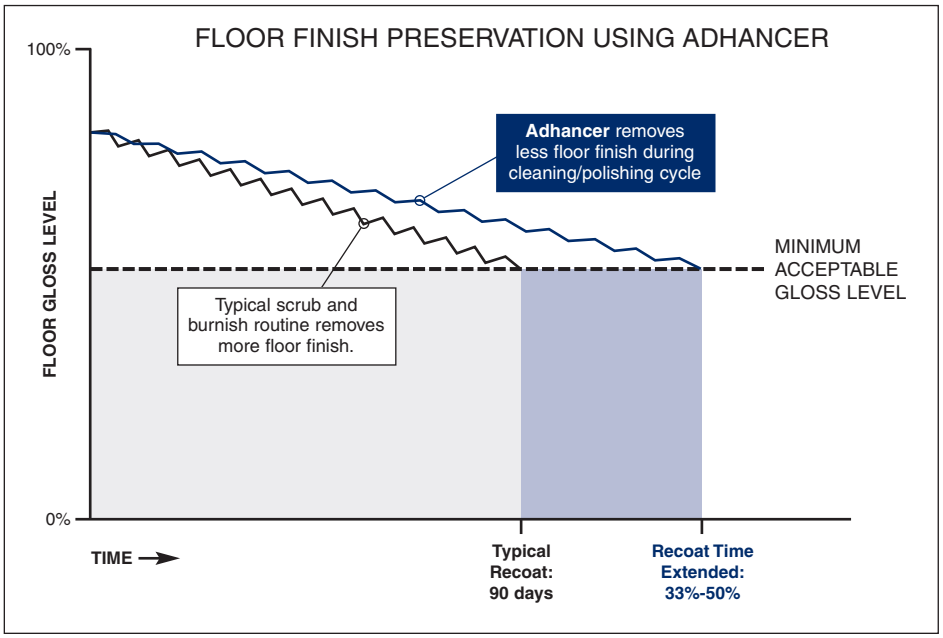

Figure 2

Results of extensive testing of the new Adhancer technology show that this costly cycle of stripping and re-finishing can be reduced by several operations each year. Instead of a normal 80- to 90-day strip and re-finish cycle, the Adhancer technology can extend the cycle 33 to 50 percent. Also, eliminating the separate, labor-intensive operations of burnishing and dusting will save up to 50 percent or greater in labor costs.

Compared to the typical sweep, scrub, burnish, dust cycle illustrated in Figure 2, the Adhancer one-pass machine provides a rather different graphic profile. Due to the design of the brushes, the lower pressure and the "snap-back" detergent, Adhancer technology cleans as well as, but not as aggressively as a typical scrubber. While it gets all the dirt off the floor, it spares the layer of finish from

both chemical and physical attack. The result is that the finish does not deteriorate as rapidly. The Adhancer technology will preserve the finish for a much longer period of time than the conventional scrub-burnish-dust method. By getting the dirt and not attacking the finish, the Adhancer machine's polishing effect is able to create an acceptable appearance level that significantly extends the strip and recoat cycle. The result is a comparably appearing floor surface combined with significant savings in equipment and labor.

CONCLUSION

Advance's new Adhancer technology has accomplished the breakthrough that was necessary to combine sweeping, scrubbing, polishing and dusting into a one-pass machine. This goal was achieved by making modifications to four key aspects of the process – brush speed, brush material, brush pressure, and detergent. Applications such as grocery, big-box retail, hospitals, airports and public buildings will be able to see significant savings in equipment and labor without compromising appearance.

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